CONTENTS OF VOLUME 19

NUMBER 1

S.U. SALMON and M.E. MALMSTRÖM: Geochemical processes in mill tailings deposits: modelling of groundwater composition 1

H. GUO and Y. WANG: Hydrogeochemical processes in shallow quaternary aquifers from the northern part of the Datong Basin, China 19

J.W. TONKIN, L.S. BALISTRIERI and J.W. MURRAY: Modeling sorption of divalent metal cations on hydrous manganese oxide using the diffuse double layer model 29

V. SCHWAB and J.E. SPANGENBERG: Organic geochemistry across the Permian–Triassic transition at the Idrijca Valley, Western Slovenia 55

M.L. CARAPEZZA and D. GRANIERI: CO_2 soil flux at Vulcano (Italy): comparison between active and passive methods 73

T. STERCKEMAN, F. DOUAY, D. BAIZE, H. FOURRIER, N. PROIX and C. SCHVARTZ: Factors affecting trace element concentrations in soils developed on recent marine deposits from northern France 89

U. GEMICI, G. TARCAN, M. ÇOLAK and C. HELVACI: Hydrogeochemical and hydrogeological investigations of thermal waters in the Emet area (Kütahya, Turkey) 105

E. WIELAND, J. TITS and M.H. BRADBURY: The potential effect of cementitious colloids on radionuclide mobilisation in a repository for radioactive waste 119

M.A. GONÇALVES, J.M.F. NOGUEIRA, J. FIGUEIRAS, C.V. PUTNIS and C. ALMEIDA: Base-metals and organic content in stream sediments in the vicinity of a landfill 137

C. GUÉGUEN, R. GILBIN, M. PARDOS and J. DOMINIK: Water toxicity and metal contamination assessment of a polluted river: the Upper Vistula River (Poland) 153

NUMBER 2

Arsenic in Groundwater of Sedimentary Aquifers
Editors: P. BHATTACHARYA, A.H. WELCH, K.M. AHMED, G. JACKS and R. NAIDU

Guest editorial
P. BHATTACHARYA, A.H. WELCH, K.M. AHMED, G. JACKS and R. NAIDU: Arsenic in groundwater of sedimentary aquifers 163

O. SRACEK, P. BHATTACHARYA, G. JACKS, J.-P. GUSTAFSSON and M. VON BRÖMSSEN: Behavior of arsenic and geochemical modeling of arsenic enrichment in aqueous environments 169

K.M. AHMED, P. BHATTACHARYA, M.A. HASAN, S.H. AKHTER, S.M.M. ALAM, M.A.H. BHUYIAN, M.B. IMAM, A.A. KHAN and O. SRACEK: Arsenic enrichment in groundwater of the alluvial aquifers in Bangladesh: an overview 181

Y. ZHENG, M. STUTE, A. VAN GEEN, I. GAVRIELI, R. DHAR, H.J. SIMPSON, P. SCHLOSSER and K.M. AHMED: Redox control of arsenic mobilization in Bangladesh groundwater 201

J. Akai, K. Izumi, H. Fukuhara, H. Masuda, S. Nakano, T. Yoshimura, H. Ohfuji, H.Md. Anawar and K. Akai: Mineralogical and geomicrobiological investigations on groundwater arsenic enrichment in Bangladesh 215

J. Bundschuh, B. Farias, R. Martin, A. Storniolo, P. Bhattacharya, J. Cortes, G. Bonorino and R. Albouy: Groundwater arsenic in the Chaco-Pampean Plain, Argentina: case study from Robles county, Santiago del Estero Province 231

R. Rodriguez, J.A. Ramos and A. Armienta: Groundwater arsenic variations: the role of local geology and rainfall 245

R.D. Foust Jr., P. Mohapatra, A.-M. Compton-O'Brien and J. Reifel: Groundwater arsenic in the Verde Valley in central Arizona, USA 251

A.E. Grosz, J.N. Grossman, R. Garrett, P. Friske, D.B. Smith, A.G. Darnley and E. Vowinkel: A preliminary geochemical map for arsenic in surficial materials of Canada and the United States 257

NUMBER 3

E. Bozau, M. Leblanc, J.L. Seidel and H.-J. Stärk: Light Rare Earth Elements enrichment in an acidic mine lake (Lusatia, Germany) 261

C. Pomiés, B. Hamelin, J. Lancelot and R. Blomqvist: $^{207}pb/^{206}pb$ and $^{238}U/^{230}Th$ dating of uranium migration in carbonate fractures from the Palmottu uranium ore (southern Finland) 273

N.J.G. Pearce, J.A. Westgate, W.T. Perkins and S.J. Preece: The application of ICP-MS methods to tephrochronological problems 289

M. Hoch and D. Schwesig: Parameters controlling the partitioning of tributyltin (TBT) in aquatic systems 323

S. Choe, H.M. Liljestrand, J. Khim: Nitrate reduction by zero-valent iron under different pH regimes 335

C.J. Brown and M.A.A. Schoonen: The origin of high sulfate concentrations in a coastal plain aquifer, Long Island, New York 343

D.C. Gosselin, F.E. Harvey, C. Frost, R. Stotlerand P.A. Macfarlane: Strontium isotope geochemistry of groundwater in the central part of the Dakota (Great Plains) aquifer, USA 359

C.S. Kim, J.J. Rytubaand G.E. Brown Jr.: Geological and anthropogenic factors influencing mercury speciation in mine wastes: an EXAFS spectroscopy study 379

E. Sacchi, A. Dematteis and P. Rossetti: Past and present circulation of CO_2-bearing fluids in the crystalline Gran Paradiso Massif (Orco Valley, north-western Italian Alps): tectonic and geochemical constraints 395

S. Bottrell, J. Coulson, M. Spence, P. Roworth, M. Novak and L. Forbes: Impacts of pollutant loading, climate variability and site management on the surface water quality of a lowland raised bog, Thorne Moors, E. England, UK 413

J.W. Phair, J.S.J. van Deventer and J.D. Smith: Effect of Al source and alkali activation on Pb and Cu immobilisation in fly-ash based "geopolymers" 423

Y. Yunmei, Z. Yongxuan, A.E. Williams-Jones, G. Zhenmin and L. Dexian: A kinetic study of the oxidation of arsenopyrite in acidic solutions: implications for the environment 435

J.V. Cruz and C.S. Amaral: Major ion chemistry of groundwater from perched-water bodies of the Azores (Portugal) volcanic archipelago 445

J. Zhu, W. Zuo, X. Liang, S. Li and B. Zheng: Occurrence of native selenium in Yutangba and its environmental implications 461

NUMBER 4

Y. Tardy, V. Bustillo and J.-L. Boeglin: Geochemistry applied to the watershed survey: hydrograph separation, erosion and soil dynamics. A case study: the basin of the Niger River, Africa 469

M. Gascoyne: Hydrogeochemistry, groundwater ages and sources of salts in a granitic batholith on the Canadian Shield, southeastern Manitoba 519

B. Andreo, C. Liñán, F. Carrasco, C.J. de Cisneros, F. Caballero and J. Mudry: Influence of rainfall quantity on the isotopic composition (^{18}O and ^{2}H) of water in mountainous areas. Application for groundwater research in the Yunquera-Nieves karst aquifers (S Spain) .. 561

F.T. da Conceição and D.M. Bonotto: Weathering rates and anthropogenic influences in a sedimentary basin, São Paulo State, Brazil 575

V.V. Gordeev, V. Rachold and I.E. Vlasova: Geochemical behaviour of major and trace elements in suspended particulate material of the Irtysh river, the main tributary of the Ob river, Siberia 593

A. Wolthoorn, E.J.M. Temminghoff, L. Weng and W.H. van Riemsdijk: Colloid formation in groundwater: effect of phosphate, manganese, silicate and dissolved organic matter on the dynamic heterogeneous oxidation of ferrous iron 611

A.P. Reis, A.J. Sousa, E.F. da Silva, C. Patinha and E.G. Fonseca: Combining multiple correspondence analysis with factorial kriging analysis for geochemical mapping of the gold–silver deposit at Marrancos (Portugal) 623

G. Rufyikiri, D. Nootens, J.E. Dufey and B. Delvaux: Mobilization of aluminium and magnesium by roots of banana (*Musa* spp.) from kaolinite and smectite clay minerals 633

NUMBER 5

M. Smith and J.S. Compton: Origin and evolution of major salts in the Darling pans, Western Cape, South Africa 645

S. Inguaggiato and A. Rizzo: Dissolved helium isotope ratios in ground-waters: a new technique based on gas–water re-equilibration and its application to Stromboli volcanic system 665

A. Blyth, S. Frape, T. Ruskeeniemi and R. Blomqvist: Origins, closed system formation and preservation of calcites in glaciated crystalline bedrock: evidence from the Palmottu natural analogue site, Finland 675

P.A. Weber, J.E. Thomas, W.M. Skinner and R.St.C. Smart: Improved acid neutralisation capacity assessment of iron carbonates by titration and theoretical calculation 687

C.-F. You, J.M. Gieskes, T. Lee, T.-F. Yui and H.-W Chen: Geochemistry of mud volcano fluids in the Taiwan accretionary prism 695

T. Fukada, K.M. Hiscock and P.F. Dennis: A dual-isotope approach to the nitrogen hydrochemistry of an urban aquifer 709

L.C. Hull, C. Grossman, R.A. Fjeld, J.T. Coates and A.W. Elzerman: Hybrid empirical–theoretical approach to modeling uranium adsorption 721

A. Deyhle and A. Kopf: Possible influence of clay contamination on B isotope geochemistry of carbonaceous samples 737

M.S. Al-Masri, Y. Amin, S. Ibrahim and F. Al-Bich: Distribution of some trace metals in Syrian phosphogypsum 747

D.M. Deocampo: Hydrogeochemistry in the Ngorongoro Crater, Tanzania, and implications for land use in a World Heritage Site 755

S. Audry, J. Schäfer, G. Blanc, C. Bossy and G. Lavaux: Anthropogenic components of heavy metal (Cd, Zn, Cu, Pb) budgets in the Lot-Garonne fluvial system (France) 769

F. Cipolli, B. Gambardella, L. Marini, G. Ottonello and M.V. Zuccolini: Geochemistry of high-pH waters from serpentinites of the Gruppo di Voltri (Geneva, Italy) and reaction path modeling of CO_2 sequestration in serpentinite aquifers 787

M. Ranville, D. Rough and A.R. Flegal: Metal attenuation at the abandoned Spenceville copper mine 803

Corrigendum

Y. Tardy, V. Bustillo and J.-L Boeglin: "Geochemistry applied to the watershed survey: hydrograph separation, erosion and soil dynamics: A case study: the basin of the Niger River, Africa" [Applied Geochemistry 19 (2004): 469–518] 817

NUMBER 6

P.A. Hernández, N.M. Pérez, J.M.L. Salazar, R. Ferrell and C.E. Álvarez: Soil volatile mercury, boron and ammonium distribution at Cañadas caldera, Tenerife, Canary Islands, Spain 819

S. Zhang, J. Li, Y. Wang and G. Hu: Dissolution kinetics of galena in acid NaCl solutions at 25–75 °C 835

J.-Y Yu and Y. Park: Sulphur isotopic and chemical compositions of the natural waters in the Chuncheon area, Korea 843

J.C. Raposo, O. Zuloaga, M.A. Olazabal and J.M. Madariaga: Study of the precipitation equilibria of arsenate anion with calcium and magnesium in sodium perchlorate at 25 °C..... 855

G. Massmann, A. Pekdeger and C. Merz: Redox processes in the Oderbruch polder groundwater flow system in Germany..... 863

E.F. da Silva, C. Zhang, L.S. Pinto, C. Patinha and P. Reis: Hazard assessment on arsenic and lead in soils of Castromil gold mining area, Portugal..... 887

D. Aubert, A. Probst and P. Stille: Distribution and origin of major and trace elements (particularly REE, U and Th) into labile and residual phases in an acid soil profile (Vosges Mountains, France)..... 899

T. Xu, J.A. Apps and K. Pruess: Numerical simulation of CO_2 disposal by mineral trapping in deep aquifers..... 917

A.M. Marfia, R.V. Krishnamurthy, E.A. Atekwana and W.F. Panton: Isotopic and geochemical evolution of ground and surface waters in a karst dominated geological setting: a case study from Belize, Central America..... 937

R.A. Sutherland, F.M.G. Tack, A.D. Ziegler and J.O. Bussen: Metal extraction from road-deposited sediments using nine partial decomposition procedures..... 947

P. Négrel, W. Kloppmann, M. Garcin and D. Giot: Lead isotope signatures of Holocene fluvial sediments from the Loire River valley..... 957

A. Neaman, F. Mouélé, F. Trolard and G. Bourrié: Improved methods for selective dissolution of Mn oxides: applications for studying trace element associations..... 973

M. Zhu, X. Jiang and G. Ji: Experimental investigation on aluminum release from haplic acrisols in southeastern China..... 981

NUMBER 7

A Tribute to Gunter Faure
Editors: W.B. Lyons, A.E. Carey and D.T. Long

Foreword
G. Faure: A call for action..... 991

Preface
W.B. Lyons, A.E. Carey and D.T. Long..... 993

R.B. McCleskey, D.K. Nordstrom and A.S. Maest: Preservation of water samples for arsenic(III/V) determinations: an evaluation of the literature and new analytical results..... 995

E.H. De Carlo, V.L. Beltran and M.S. Tomlinson: Composition of water and suspended sediment in streams of urbanized subtropical watersheds in Hawaii..... 1011

N.M. Piatak, R.R. Seal II and J.M. Hammarstrom: Mineralogical and geochemical controls on the release of trace elements from slag produced by base- and precious-metal smelting at abandoned mine sites..... 1039

L.A. Munk and G. Faure: Effects of pH fluctuations on potentially toxic metals in the water and sediment of the Dillon Reservoir, Summit County, Colorado 1065

D.M. McKnight and S.M. Duren: Biogeochemical processes controlling midday ferrous iron maxima in stream waters affected by acid rock drainage 1075

L.M. Centeno, G. Faure, G. Lee and J. Talnagi: Fractionation of chemical elements including the REEs and ^{226}Ra in stream contaminated with coal-mine effluent 1085

G.R. Robinson Jr and R.A. Ayuso: Use of spatial statistics and isotopic tracers to measure the influence of arsenical pesticide use on stream sediment chemistry in New England, USA 1097

S.A. Munson and A.E. Carey: Organic matter sources and transport in an agriculturally dominated temperate watershed 1111

J.W. Ball and J.A. Izbicki: Occurrence of hexavalent chromium in ground water in the western Mojave Desert, California 1123

K. Szramek, L.M. Walter and P. McCall: Arsenic mobility in groundwater/surface water systems in carbonate-rich Pleistocene glacial drift aquifers (Michigan) 1137

S. Yohn, D. Long, J. Fett and L. Patino: Regional versus local influences on lead and cadmium loading to the Great Lakes region 1157

J.R. Graney and T.M. Eriksen: Metals in pond sediments as archives of anthropogenic activities: a study in response to health concerns 1177

C.W. Holmes and R. Miller: Atmospherically transported elements and deposition in the Southeastern United States: local or transoceanic? 1189

NUMBER 8

S. Buschaert, S. Fourcade, M. Cathelineau, E. Deloule, F. Martineau, M. Ayt Ougougdal and A. Trouiller: Widespread cementation induced by inflow of continental water in the eastern part of the Paris basin: O and C isotopic study of carbonate cements 1201

J.C. Stephens and J.G. Hering: Factors affecting the dissolution kinetics of volcanic ash soils: dependencies on pH, CO_2, and oxalate 1217

I. Cartwright, T.R. Weaver, S. Fulton, C. Nichol, M. Reid and X. Cheng: Hydrogeochemical and isotopic constraints on the origins of dryland salinity, Murray Basin, Victoria, Australia 1233

J.M. McArthur, D.M. Banerjee, K.A. Hudson-Edwards, R. Mishra, R. Purohit, P. Ravenscroft, A. Cronin, R.J. Howarth, A. Chatterjee, T. Talukder, D. Lowry, S. Houghton and D.K. Chadha: Natural organic matter in sedimentary basins and its relation to arsenic in anoxic ground water: the example of West Bengal and its worldwide implications 1255

B. Bellanger, S. Huon, P. Steinmann, F. Chabaux, F. Velasquez, V. Vallès, K. Arn, N. Clauer and A. Mariotti: Oxic–anoxic conditions in the water column of a tropical freshwater reservoir (Peña-Larga dam, NW Venezuela) 1295

S. Dai, D. Li, D. Ren, Y. Tang, L. Shao and H. Song: Geochemistry of the late Permian No. 30 coal seam, Zhijin Coalfield of Southwest China: influence of a siliceous low-temperature hydrothermal fluid 1315

S. Rovio, M. Mäntynen and H. Sirén: Determination of bromide and potassium in saline groundwaters by capillary electrophoresis without prior dilution 1331

P.L. Verplanck, D.K. Nordstrom, H.E. Taylor and B.A. Kimball: Rare earth element partitioning between hydrous ferric oxides and acid mine water during iron oxidation 1339

NUMBER 9

M.N. Tijani: Evolution of saline waters and brines in the Benue-Trough, Nigeria 1355

K.M. Witte, R.B. Wanty and W.I. Ridley: Engelmann Spruce (*Picea engelmannii*) as a biological monitor of changes in soil metal loading related to past mining activity 1367

K.L. Linge and C.E. Oldham: Control mechanisms for dissolved phosphorus and arsenic in a shallow lake 1377

A. Wolthoorn, E.J.M. Temminghoff and W.H. van Riemsdijk: Colloid formation in groundwater by subsurface aeration: characterisation of the geo-colloids and their counterparts 1391

E. Krawczyk-Bärsch, T. Arnold, H. Reuther, F. Brandt, D. Bosbach and G. Bernhard: Formation of secondary Fe-oxyhydroxide phases during the dissolution of chlorite – effects on uranium sorption 1403

P. Ravenscroft and J.M. McArthur: Mechanism of regional enrichment of groundwater by boron: the examples of Bangladesh and Michigan, USA 1413

A.R. Hoch, C.M. Linklater, D.J. Noy and W.R. Rodwell: Modelling the interaction of hyperalkaline fluids with simplified rock mineral assemblages 1431

A. Ohta, N. Imai, S. Terashima, Y. Tachibana, K. Ikehara and T. Nakajima: Geochemical mapping in Hokuriku, Japan: influence of surface geology, mineral occurrences and mass movement from terrestrial to marine environments 1453

A.J. Tesoriero, T.B. Spruill and J.L. Eimers: Geochemistry of shallow ground water in coastal plain environments in the southeastern United States: implications for aquifer susceptibility 1471

H.R. Beller, V. Madrid, G.B. Hudson, W.W. McNab and T. Carlsen: Biogeochemistry and natural attenuation of nitrate in groundwater at an explosives test facility 1483

D.A.C. Manning and I.E. Hutcheon: Distribution and mineralogical controls on ammonium in deep groundwaters 1495

NUMBER 10

E.C. Gaucher, P. Blanc, J.-M. Matray and N. Michau: Modeling diffusion of an alkaline plume in a clay barrier 1505

P. PULIDO-LEBOEUF: Seawater intrusion and associated processes in a small coastal complex aquifer (Castell de Ferro, Spain) 1517

N. YAMASAKI, I.R. KORABLOVA and S.F. KORABLOV: Protective mineral layers formed from granite–dry steam interaction 1529

A. WIDERLUND, E. SHCHERBAKOVA, J. FORSBERG, H. HOLMSTRÖM and B. ÖHLANDER: Laboratory simulation of flocculation processes in a flooded tailings impoundment at the Kristineberg Zn–Cu mine, northern Sweden 1537

Y. CHEN, Z. SHEN and X. LI: The use of vetiver grass (*Vetiveria zizanioides*) in the phytoremediation of soils contaminated with heavy metals 1553

R. KURKJIAN, C. DUNLAP and A.R. FLEGAL: Long-range downstream effects of urban runoff and acid mine drainage in the Debed River, Armenia: insights from lead isotope modeling 1567

T. MATSUNAGA, S. NAGAO, T. UENO, S. TAKEDA, H. AMANO and YU. TKACHENKO: Association of dissolved radionuclides released by the Chernobyl accident with colloidal materials in surface water 1581

J. BRANDENBERGER, P. LOUCHOUARN, B. HERBERT and P. TISSOT: Geochemical and hydrodynamic controls on arsenic and trace metal cycling in a seasonally stratified US sub-tropical reservoir 1601

L.B. WILLIAMS and R.L. HERVIG: Boron isotope composition of coals: a potential tracer of organic contaminated fluids 1625

J.A.C. BARTH and J. VEIZER: Water mixing in a St. Lawrence river embayment to outline potential sources of pollution 1637

G.P. CURTIS, P. FOX, M. KOHLER and J.A. DAVIS: Comparison of in situ uranium K_D values with a laboratory determined surface complexation model 1643

NUMBER 11

P.B. MCMAHON, J.K. BÖHLKE and S.C. CHRISTENSON: Geochemistry, radiocarbon ages, and paleorecharge conditions along a transect in the central High Plains aquifer, southwestern Kansas, USA. 1655

E. WALPERSDORF, T. NEUMANN and D. STÜBEN: Efficiency of natural calcite precipitation compared to lake marl application used for water quality improvement in an eutrophic lake 1687

P. VIEILLARD, S. RAMÍREZ, A. BOUCHET, A. CASSAGNABÈRE, A. MEUNIER and E. JACQUOT: Alteration of the Callovo-Oxfordian clay from Meuse-Haute Marne Underground Laboratory (France) by alkaline solution: II. Modelling of mineral reactions 1699

S.-G. LEE, Y. KIM, B.-G. CHAE, D.-C. KOH and K.-H. KIM: The geochemical implication of a variable Eu anomaly in a fractured gneiss core: application for understanding Am behavior in the geological environment 1711

E. Tatár, V.G. Mihucz, L. Zámbó, T. Gasparics and G. Záray: Seasonal changes of fulvic acid, Ca and Mg concentrations of water samples collected above and in the Béke Cave of the Aggtelek karst system (Hungary) 1727

G. Zhang, C.-Q. Liu, P. Wu and Y. Yang: The geochemical characteristics of mine-waste calcines and runoff from the Wanshan mercury mine, Guizhou, China 1735

A.J.P. Smolders, K.A. Hudson-Edwards, G. Van der Velde and J.G.M. Roelofs: Controls on water chemistry of the Pilcomayo river (Bolivia, South-America) 1745

U. Berg, T. Neumann, D. Donnert, R. Nüesch and D. Stüben: Sediment capping in eutrophic lakes – efficiency of undisturbed calcite barriers to immobilize phosphorus 1759

C. Woulds and B.T. Ngwenya: Geochemical processes governing the performance of a constructed wetland treating acid mine drainage, Central Scotland 1773

F. Bodénan, P. Baranger, P. Piantone, A. Lassin, M. Azaroual, E. Gaucher and G. Braibant: Arsenic behaviour in gold-ore mill tailings, Massif Central, France: hydrogeochemical study and investigation of in situ redox signatures 1785

R.P. Mason, E.-H. Kim and J. Cornwell: Metal accumulation in Baltimore Harbor: current and past inputs 1801

J.L. Bischoff, I. Israde-Alcántara, V.H. Garduño-Monroy and W.C. Shanks III: The springs of Lake Pátzcuaro: chemistry, salt-balance, and implications for the water balance of the lake 1827

J. Smith and M.D. Melville: Iron monosulfide formation and oxidation in drain-bottom sediments of an acid sulfate soil environment 1837

P. Higueras, R. Oyarzun, J. Oyarzún, H. Maturana, J. Lillo and D. Morata: Environmental assessment of copper–gold–mercury mining in the Andacollo and Punitaqui districts, northern Chile 1855

Y.V. Dublyansky, S.Z. Smirnov and G.P. Palyanova: Comment on: "Physical and stable-isotope evidence for formation of secondary calcite and silica in the unsaturated zone, Yucca Mountain, Nevada" by J.F. Whelan, J.B. Paces and Z.E. Peterman 1865

J.F. Whelan, J.B. Paces, Z.E. Peterman, B.D. Marshall and L.A. Neymark: Reply to the comment on "Physical and stable-isotope evidence for formation of secondary calcite and silica in the unsaturated zone, Yucca Mountain, Nevada", by Y.V. Dublyansky, S.E. Smirnov and G.P. Palyanova. 1879

NUMBER 12

P. Piantone, F. Bodénan and L. Chatelet-Snidaro: Mineralogical study of secondary mineral phases from weathered MSWI bottom ash: implications for the modelling and trapping of heavy metals 1891

D. Banks, V.P. Parnachev, B. Frengstad, W. Holden, O.V. Karnachuk and A.A. Vedernikov: The evolution of alkaline, saline ground- and surface waters in the southern Siberian steppes 1905

S. Ehrlich, Y. Harlavan, M. Bar-Matthews and L. Halicz: Lead and uranium isotopic behavior in diagenetic and epigenetic manganese nodules, Timna Basin, Israel, determined by MC-ICP-MS 1927

B.A. LOGUE, R.W. SMITH and J.C. WESTALL: U(VI) adsorption on natural iron-coated sands: comparison of approaches for modeling adsorption on heterogeneous environmental materials 1937

P.A. WEBER, W.A. STEWART, W.M. SKINNER, C.G. WEISENER, J.E. THOMAS and R.ST.C. SMART: Geochemical effects of oxidation products and framboidal pyrite oxidation in acid mine drainage prediction techniques 1953

L. PEKKA, J. INGRI, A. WIDERLUND, O. MOKROTOVAROVA, M. RIABTSEVA and B. ÖHLANDER: Geochemistry of the Kola River, northwestern Russia 1975

Annual Index I

MAJOR CLASSIFICATION INDEX OF ARTICLES

ANALYTICAL METHODS

Application of ICP-MS to tephrochronology 289–322
CO_2 flux at Vulcano, comparison of active and passive methods 73–88
Determination of Br^- and K in saline groundwaters 1331–1337
Dissolved He isotopes, technique based on gas–water re-equilibration 665–674
Improved acid neutralisation capacity assessment of Fe carbonates 687–694
Improved methods for selective dissolution of Mn oxides 973–979
Metal extraction from road sediments using partial decomposition 947–955
Preservation of water samples for As(III/V) determinations 995–1009

ENERGY RESOURCES

Geothermal

Protective mineral layers formed from granite–dry steam interaction 1529–1535

ENVIRONMENTAL GEOCHEMISTRY

Anthropogenic components of heavy metals in the Lot–Garonne fluvial system 769–786
As behaviour in Au-ore tailings, Massif Central, France 1785–1800
Association of dissolved radionuclides released by the Chernobyl accident with colloids in surface water 1581–1599
Atmospherically transported elements and deposition in southeast U.S.A. 1189–1200
Base-metals and organic content in stream sediments in the vicinity of a landfill 137–151
Biogeochemical processes controlling midday Fe(II) maxima in streams affected by acid rock drainage 1075–1084
Boron isotope composition of coals: potential tracer of organic contaminated fluid 1625–1636
Comparison of in situ uranium K_D values with laboratory determined surface complexation model 1643–1653
Composition of water and suspended sediment in streams of an urbanised subtropical watershed 1011–1037
Controls on dissolution of As and P in a shallow lake 1377–1389
Controls on water chemistry of the Pilcomayo River, Bolivia 1745–1758
Distribution and origin of major elements, REE, U and Th in an acid soil profile 899–916
Distribution of trace metals in Syrian phosphogypsum 747–753
Effects of pH fluctuations on potentially toxic metals in water and sediment in a reservoir 1065–1074
Efficiency of natural calcite precipitation compared to lake marl for improvement of water quality in an eutrophic lake 1687–1698
Engelmann spruce as a biological monitor of changes in soil metal loading related to past mining 1367–1376
Environmental assessment of Cu–Au–Hg mining in northern Chile 1855–1864
Evolution of alkaline, saline ground- and surface waters in the southern Siberian steppes 1905–1926

Experimental investigation on Al release from haplic acrisols 981–990
Factors affecting geochemistry of soils developed on recent marine deposits 73–88
Fe monosulfide formation and oxidation in drain bottom sediments of acid sulfate soil 1837–1853
Formation of secondary Fe-oxyhydioxide during dissolution of chlorite, effects on U sorption 1403–1412
Fractionation of elements including REE and ^{226}Ra in stream waters affected by coal-mine effluent 1085–1095
Geochemical and hydrodynamic controls on As and trace metal cycling in a seasonally stratified reservoir 1601–1623
Geochemical characteristics of mine waste and runoff from a Hg mine 1735–1744
Geochemical effects of oxidation products and framboidal pyrite oxidation in acid mine drainage prediction techniques 1953–1974
Geochemical implication of a variable Eu anomaly in a fractured gneiss 1711–1725
Geochemical processes governing the performance of a constructed wetland treating acid mine drainage 1773–1783
Geochemistry applied to the watershed survey. A case study: Niger River Basin 469–518
Geochemistry of a Permian coal seam, influence of hydrothermal fluid 1315–1330
Geochemistry of mud volcano fluids, Taiwan accretionary prism 695–707
Geochemistry of suspended particulate material in the Iitysh river, Russia 593–610
Geochemistry of the Kola River, NW Russia 1975–1995
Geological and anthropogenic factors influencing mercury speciation in mine wastes 379–393
Hazard assessment on As and Pb in soils of a former Au mining area 887–898
Hg, B and NH_4 distribution at Cañadas caldera, Canary Islands, Spain 819–834
Hydrogeochemical and isotopic constraints on the origins of dryland salinity 1233–1254
Hydrogeochemistry in the Ngorongoro Crater, Tanzania, implications for land use 755–767
Impacts of pollutant loading, climate variability and site management on surface water quality of a lowland raised bog 413–422
Kinetics of arsenopyrite oxidation, implications for the environment 435–444
Laboratory simulation of flocculatioa processes in a flooded tailings impoundment 1537–1551
Light rare earth elements in an acidic mine lake 261–271
Long-range downstream effects of urban runoff and acid mine drainage,
insights from Pb isotope modelling 1567–1580
Metal accumulation in Baltimore harbour, current and past inputs 1801–1825
Metal attenuation at the abandoned Spenceville Cu mine 803–815
Metals in pond sediments as archives of anthropogenic activities 1177–1188
Mineralogical and geochemical controls on release of trace elements from metal smelter slag 1039–1064
Mobilisation of Al and Mg by roots of banana 633–643
Occurrence of native Se in Yutangba and its environmental implications 461–467
Organic matter sources and transport in an agriculture-dominated temperate watershed 1111–1121
Origin and evolution of major salts in the Darling pans, Western Cape, South Africa 645–664
Oxic–anoxic conditions in the water column of a tropical freshwater reservoir 1295–1314

Parameters controlling tributyltin in aquatic systems 323–334
Pb and U isotopic behaviour in Mn nodules of Timna Basin, Israel 1927–1936
Pb isotope signatures of Holocene fluvial sediments of the Loire Valley 957–972
$^{207}Pb/^{206}Pb$ and $^{238}U/^{230}Th$ dating of U migrating from the Palmottu U ore 273–288
Possible influence of clay contamination on B isotopes in carbonate samples 737–745
Precipitation equilibria of the arsenate anion with Ca and Mg in Na perchlorate 855–862
Rare earth element partitioning between hydrous Fe(III) oxides and acid mine water 1339–1354
Regional versus local influences on Pb and Cd loading to the Great Lakes region 1157–1175
S isotopic and chemical compositions of the natural waters in the Chuncheon area, Korea 843–853
Seasonal variation of chemistry of cave waters in a karst system 1727–1733
Sediment capping in eutrophic lakes, efficiency of calcite barrier 1759–1771
Springs of Lake Pátzcuaro; chemistry, salt balance and implications for water balance of the lake 1827–1835
Use of spatial statistics and isotope tracers to measure the influence of arsenical pesticides on stream sediments in New England 1097–1110
Use of vetiver grass in phytoremediation of contaminated soils 1553–1565
Water mixing in a St. Lawrence embayment to outline potential sources of pollution 1637–1641
Water toxicity and metal contamination of a polluted river 153–162

Geochemical mapping

Combining multiple correspondence analysis with factorial kriging analysis for geochemical mapping 623–631
Geochemical mapping in Hokuriku, Japan 1453–1469
Preliminary map for As in surficial materials of Canada and U.S.A. 257–260

Groundwater

Arsenic enrichment in groundwater of alluvial aquifers of Bangladesh 181–200
Arsenic mobility in groundwater/surface water systems in a carbonate rich glacial drift aquifer 1137–1155
Biogeochemistry and natural attenuation of NO_3 in groundwater at an explosives test facility 1483–1494
Colloid formation in groundwater: characterisation of the colloids 1391–1402
Colloid formation in groundwater: effect of PO_4, Mn, silicate and DOM on dynamic heterogeneous oxidation of Fe(II) 611–622
Distribution and mineralogical controls on NH_4 in deep groundwater 1495–1503
Dual approach to the N hydrochemistry of an urban aquifer 709–719
Evolution of saline waters in the Benue Trough, Nigeria 1355–1365
Geochemistry of high-pH waters from serpentinites and reaction path modelling of CO_2 sequestration in serpentinite aquifers 787–802
Geochemistry of shallow groundwater in coastal plain areas of southeast U.S.A. 1471–1482
Geochemistry, radiocarbon ages and paleorecharge along a transect of the High Plains aquifer, Kansas 1655–1686

Groundwater As in the Chaco-Pampiean Plain, a case study 231–243
Groundwater As in Verde Valley, Arizona, U.S.A. 251–255
Groundwater As variations: role of local geology and rainfall 245–250
Hydrogeochemical processes in shallow Quaternary aquifers, Datong Basin, China 19–27
Hydrogeochemistry, groundwater ages and sources of salts in a granitic batholith 519–560
Influence of rainfall on the ^{2}H and ^{18}O composition of water in mountainous areas 561–574
Isotopic and geochemical evolution of ground and surface waters in a karst dominated geological setting 937–946
Major ion chemistry of perched water bodies of the Azores volcanic islands, Portugal 445–459
Mechanism of regional enrichment of groundwater by B 1413–1430
Mineralogical and geomicrobiological investigations of groundwater As enrichment in Bangladesh 215–230
Natural organic matter in sedimentary basins and its relation to As in anoxic groundwater 1255–1293
Nitrate reduction by Fe^{0} under different pH regimes 335–342
Occurrence of Cr(VI) in ground water of the western Mojave desert 1123–1135
Origin, closed system formation and preservation of calcites in glaciated crystalline bedrock 675–686
Origin of SO_4 in a coastal aquifer, Long Island, New York 359–377
Past and present circulation of CO_2-bearing fluids in the crystalline Gran Paradiso Massif, Italian Alps 395–412
Redox control of As mobilisation in Bangladesh groundwater 201–214
Redox processes in the Olderbruch polder groundwater, Germany 863–886
Seawater intrusion and associated processes in a small coastal complex aquifer 1517–1527
Sr isotopes in groundwater of the Dakota aquifer, U.S.A. 359–377
Widespread cementation induced by inflow of continental water in the Paris Basin 1201–1215

Organic

Organic geochemistry across the Peimian-Triassic transition at Idrijca Valley, Western Slovenia 55–72

Thermal water

Hydrogeochemical and hydrogeological investigations of thermal waters, Emet, Turkey 105–117

Waste disposal (nuclear)

Potential effect of cementitious colloids on radionuclide mobilisation 119–135

Waste disposal (other)

Effect of Al source and alkali activation on Pb and Cu immobilisation in fly-ash based geopolymers 423–434
Mineralogical study of secondary mineral phases from weathered MSWI bottom ash 1891–1904

Weathering

Factors affecting the dissolution kinetics of volcanic ash soils 1217–1232
Weathering rates and anthropogenic influences in a sedimentary basin 575–591

MINERAL RESOURCES

Dissolution kinetics of galena in acid NaCl solutions at 25–75 °C 835–841

MODELLING

Alteration of the Callovo-Oxfordian clay from Meuse-Haute Marne underground laboratory: II Modelling mineral reactions 1699–1709
Behavior of As and geochemical modelling of As in aqueous environments 169–180
Geochemical processes in mill tailings: modelling groundwater composition 1–17
Hybrid empirical theoretical approach to modelling uranium adsorption 721– 736
Modelling diffusion of an alkaline plume in a clay barrier 1505–1515
Modelling interaction of hyperalkaline fluids with mineral assemblages 1431–1451
Modelling sorption of divalent metal cations on manganese oxide 29–53
Numerical simulation of CO_2 disposal by mineral trapping in deep aquifers 917–936
U(VI) adsorption on natural Fe-coated sands: comparison of approaches for modelling 1937–1951

OTHER TOPICS

Critical comment

1855–1864

Corrigendum

817

Guest editorial

163–167

Foreword

991

Preface

993–994

Reply to critical comment

1865–1877

SUBJECT INDEX

Accretionary prism, Taiwan 695
Acid–base accounting, techniques 1953
Acid lake water, from lignite mining 261
Acid mine/rock drainage 261, 435, 803, 1075, 1085, 1339, 1537, 1567
    from tailings 1, 1785
    prediction 1953
    reactive transport, modelling of 1075
    remediation 1773
Acid neutralisation capacity, assessment of 687
Acid rain 843
Acid sulfate soil 1837
Aeolian Islands, Italy 665
Ag
    in harbour sediment 1801
    in reservoir sediment 1065
    in road sediment 1011
    in smelter slag 1039
    in soil 623
    in tailings 1785
    in volcanic ash 231
Aggteklek karst system, Hungary 1727
Agriculture, contamination from 1011, 1098, 1111, 1471, 1975
Al
    in acid mine/rock drainage 1339, 1773
    in coal 1315, 1953
    in coal mine drainage 1085
    in constructed wetland 1773
    in groundwater 519, 1233, 1655, 1785
    in laterite 973
    in meteoric water 843
    in Mn nodules 1923
    in municipal solid waste 1891
    in reservoir sediment 1065
    in road sediment 947, 1011
    in smelter slag 1039
    in surface water 803, 843, 1567, 1785, 1975
    in suspended particulate matter 593, 1601
    in tailings 1537, 1785
    in tailings drainage 1785
    in thermal water 105
    in wind blown sediment 1189
    release from soils on acidification 973
    toxicity, in plants 633
    uptake, by banana plants 633
Alabama, U.S.A. 1189
Alaska, U.S.A. 289
Alberta, Canada 1495
Alps, Italy 395
Altamont Hills, California 1483
Am, Eu as analogue for 1711

^{241}Am
complexation with natural colloids 1581
in surface water 1581
Andacollo mining district, Coquimbo region, Chile 1855
Andes
Bolivia 1745
Venezuela 1295
Anoxia, in reservoir waters 1295
Ar, in groundwater 1655
Arendsee Lake. N.E. Germany 1687
Argentina 1745
Chaco-Pampean Plain 231
Arizona, U.S.A. 251
Arkansas, U.S.A. 1255
Armenia
Debed River 1567
Vanadzor 1567
Arsenopyrite, stability of 435
As
contamination from pesticides 1098
human health problems of 163, 169, 181, 201, 231, 245, 435, 1255
in acid mine drainage 435
in aquifer sediment 181, 215, 1255
in coal 1315
in drinking water 1601
in fluvial sediment 137, 257, 1098, 1453, 1855
in groundwater 163, 169, 181, 201, 215, 231, 245, 251, 395, 435, 519, 1123, 1137, 1255, 1601, 1785
sources of 215, 231, 245, 251, 1137, 1255
in harbour sediment 1801
in lake sediment 1377
re-mobilisation from 1377
in laterite 973
in municipal solid waste 1891
in road sediment 1011
in smelter slag 1039
in soil 89, 257, 623, 887, 1137, 1855
risk exposure, assessment of 887
in surface water 435, 593, 1377, 1785, 1855, 1975
cycling in 1601
in suspended paniculate matter 593, 1011, 1601
in tailings 1785, 1855
in tailings drainage 1785
in thermal water 105
in volcanic ash 231
redox state, in water 169, 435, 1011
release
from arsenopyrite 435
from lake sediment 1377
from pyrite 1137
into groundwater 169, 201, 215
role of microbes in 215
role of natural organic matter in 1255
sorption, by Fe oxide/hydroxide 169, 215

speciation in tailings drainage 1785
AsO_4
alkaline earths, solubility of 855
stability of 855
Au
exploration 623
extraction, use of Hg for 379, 1855
in smelter slag 1039
in soil 623
in tailings 1785
Australia
New South Wales 1837
South Australia 423
Victoria 1233
Western Australia 1377
Azores, Portugal 445, 1189

B
in carbonate 737
in clay 737
in coal 1315, 1625
in groundwater 395, 519, 1413, 1517, 1655, 1905
source of 1413
in mud volcano fluid 695
in soil 819
in surface water 1905
sorption/desorption in aquifer sediments 1413
^{11}B
determination, in impure carbonates 737
in carbonate 737
in clay 737
in coal 1625
potential for tracing organic contaminants 1625
in groundwater 1655
in mud volcano fluid 689
Ba
in acid mine/rock drainage 1339
in coal 1315
in fluvial sediment 137, 1453
in groundwater 395, 519, 1233, 1255, 1355, 1785
in laterite 973
in marine sediment 1453
in Mn nodules 1927
in municipal solid waste 1891
in peat 593
in reservoir water 1295
in road sediment 1011
in smelter slag 1039
in surface water 593, 1295, 1581, 1785, 1975
in suspended particulate matter 593, 1011
in tailings drainage 1785
in tephra 289
in volcanic ash 231

Background, establishing, pre-mining 1367
Baltimore, Maryland, U.S.A. 1801
Bangladesh 169, 181, 201, 215
    Barisal District 1413
Barents Sea 1975
Barisal District, Bangladesh 1413
Be
    in coal 1315
    in fluvial sediment 1453
    in marine sediment 1453
    in mud volcano fluid 695
    in smelter slag 1039
    in tephra 289
Belize, central America 937
Bengal Basin 169, 1255
Benue Trough, Nigeria 1355
Betic Cordillera, S. Spain 561
Bi
    in coal 1315
    in fluvial sediment 1453
    in marine sediment 1453
    in smelter slag 1039
    in soil 89, 623
    in volcanic ash 231
Bioavailability, of contaminant metals 803
Biomarkers, in sediment 55
Boconó Watershed, Venezuela 1295
Bolivia 1745
Br
    in coal 1315
    in groundwater 343, 519, 1233, 1331, 1355, 1495, 1517
        determination of 1331
    in soil 1233
    in thermal water 105
Brahmaputra River, Bangladesh 1413
Brazil
    São Paulo 575
    Serro do Navio 973
Broome County, New York, U.S.A. 1177

C
    in municipal solid waste 1891
    in suspended organic matter, seasonal variation of 1111
    in tailings 1785
^{13}C
    in aquifer sediment 1255
    in carbonates 55, 395, 675, 1201
    in groundwater 519, 937, 1233, 1255, 1655
    in kerogen 55
    in mud volcano fluid 695
    in surface water 937
    in suspended organic matter 1111, 1295

^{14}C
in groundwater 519
for dating of 1655
C_4/C_3 plant matter, in rivers, seasonal variation 1111
Ca
in acid mine/rock drainage 1773
in cave drip water 1727
in coal 1315, 1953
in constructed wetland 1773
in groundwater 19, 231, 343, 359, 395, 445, 519, 611, 755, 787, 863, 1137, 1233, 1255, 1331, 1355, 1391, 1413, 1471, 1483, 1495, 1517, 1655, 1785, 1827, 1905
in laterite 973
in meteoric water 575, 843
in Mn nodules 1927
in mud volcano fluid 695
in municipal solid waste 1891
in peat 593
in reservoir water 1295
in road sediment 1011
in salt pans 655
in smelter slag 1039
in surface water 469, 575, 655, 755, 843, 863, 937, 1295, 1567, 1581, 1745, 1785, 1827, 1905, 1975
in suspended particulate matter 593
in tailings 1537, 1785
in tailings drainage 1785
in thermal water 105
Calcutta, India 1255
California, U.S.A. 289, 379, 803, 1123, 1217, 1483
Canada 257
Alberta 1493
Manitoba 519
Yukon 289
Canary Islands, Spain 819
Capillary electrophoresis, use for analysis of groundwater 1331
Carbonates, acid neutralisation capacity of 687
Carboxylic acids, in fluvial sediment 137
Castell de Ferro, Spain 1517
Castromil mining area, Sobreira, Portugal 887
Cave drip water, chemistry of, seasonal variation 1727
Cd
in acid mine/rock drainage 1339
in coal 1315
in drain sediment from acid sulfate soils 1837
in fluvial sediment 769, 803, 1453, 1855
in groundwater 519, 1785
in harbour sediment 1801
in lake sediment 1157, 1177
sources of 1157
in laterite 973
in marine sediment 1453
in phosphogypsum 747
in reservoir sediment 1065
in road sediment 1011

in smelter slag 1039
in soil 89, 1367, 1553, 1855
in surface water 153, 593, 769, 803, 1011, 1785, 1855, 1975
in suspended particulate matter 593, 769, 1011
in tailings 1537, 1855
in tailings drainage 1785
in thermal water 105
in tree rings 1367
uptake by grass 1553
toxicity of 153
Ce
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in smelter slag 1039
in soil 899
in tephra 289
in volcanic ash 231
CH_4
in groundwater 787, 1655
in mud volcano fluid 695
Chaco-Pampean Plain, Argentina 231
Chernobyl nuclear accident 1581
Chesapeake Bay, U.S.A. 1801
Cheshire, England, U.K. 1495
Chile 169
Coquimbo region 1855
China 169, 981
Guangdong Province 835
Guizhou Province 435, 1315, 1735
Hubei Province 461
Nanjing 1553
Shanxi Province 19
Yunnan Province 435
Chuncheon, Kangwon-Do Province, Korea 843
Cl
in acid lake water 261
in acid mine/rock drainage 435, 1339
in groundwater 19, 201, 231, 261, 343, 359, 395, 435, 445, 519, 709, 755, 787, 863, 1137, 1233, 1255, 1331, 1355, 1471, 1483, 1495, 1517, 1581, 1655, 1785, 1827, 1905
in meteoric water 575, 843, 1637
in mud volcano fluid 695
in reservoir water 1295
in salt pans 655
in soil 1233

in surface water 153, 435, 469, 575, 655, 755, 843, 1295, 1637, 1745, 1785, 1827, 1905, 1975
in tailings drainage 1785
in thermal water 153
Clay, adsorption of tributyltin by 324
Co
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 803, 1453
in groundwater 519
in harbour sediment 1801
in laterite 973
in peat 593
in reservoir sediment 1065
in reservoir water 1295
in road sediment 947, 1011
in smelter slag 1039
in soil 89, 623
in surface water 153, 803, 1011, 1601, 1975
redox cycling in 1601
in suspended particulate matter 593, 1011, 1601
in tailings 1537
in tephra 289
in volcanic ash 231
CO_2
flux from soil 73
measurement of 73
in groundwater 1233
sources of 395
in soils 73, 1217
role in weathering 1217
sequestration, modelling of 787, 917
Coal geochemistry 1949
influence of hydrothermal fluid on 1315
Coal mine drainage, contamination from 1085
Colloids
characterisation of 1391
formation of 1403
Colorado, U.S.A. 1065, 1075, 1339, 1367, 1643
Connecticut, U.S.A. 1098
Contamination, potential, of isolated near shore ecosystems, St. Lawrence River 1637
Continental river, controls on chemistry 1745
Coquimbo region, Chile 1855
Corrigendum 817
Corumbataí River Basin, São Paulo, Brazil 575
Cr
in coal 1315
in drain sediment from acid sulfate soils 1837
in fluvial sediment 1453
in groundwater 519, 1123
in harbour sediment 1801
in lake sediment 1177
in laterite 973

in marine sediment 1453
in peat 593
in road sediment 1011
in smelter slag 1039
in soil 59
in surface water 153, 593, 1975
in suspended particulate matter 593, 1011, 1601
in tailings 1785
in tephra 289
in thermal water 105
in wind blown sediment 1189
toxicity of 153
Cr(VI)
in groundwater 1123
analysis of 1123
Critical comment 1865
Cs
in coal 1315
in fluvial sediment 1453
in marine sediment 1453
in smelter slag 1039
in suspended particulate matter 1601
in tephra 289
in volcanic ash 231
^{137}Cs
in soil 1581
in surface water 1581
to date sediments 1177
Cu
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in drain sediment from acid sulfate soils 1837
in fluvial sediment 137, 769, 803, 1098, 1453, 1855
in groundwater 519, 1785
in harbour sediment 1801
in lake sediment 1177
in laterite 973
in marine sediment 1453
in Mn nodules 1927
in phosphogypsum 747
in reservoir sediment 1065
in road sediment 947, 1011
in smelter slag 1039
in soil 89, 623, 1367, 1553, 1855
in surface water 153, 593, 769, 803, 1011, 1567, 1785, 1855, 1975
in suspended particulate matter 593, 769, 1011
in tailings 1537, 1785, 1855
in tailings drainage 1785
in tree rings 1367
in volcanic ash 231
in wind blown sediment 1189
uptake by grass 1553

stability in geopolymers 423
toxicity of 153

Dakota aquifer, Kansas/Nebraska, U.S.A. 359
Datong Basin, Shanxi Province, China 19
Debed River, Armenia 1567
Dendrochemistry, tree ring, to monitor changes in soil chemistry 1367
use of laser ablation ICP-MS for 1367
Derbyshire, England, U.K. 1495
Drylands, salinity in 1233
Dy
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231

East Midlands, England, U.K. 709
Editorial, guest 163
Emet Geothermal Field, Turkey 105
Engelmann Spruce (*Picea engelmannii*), dendrochemistry of, 1367
England, U.K. 1431
Cheshire 1495
Derbyshire 1495
East Midlands 709
Lincolnshire 413
Nottinghamshire 709, 1495
Yorkshire 413, 1495
Enshi, Hubei Province, China 461
Epple Lake, Neckar valley, SW Germany 1759
Er
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899

in tephra 289
in volcanic ash 231
Eu
as analogue of Am 1711
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Eurajoki, Finland 1331
Eutrophication, in lakes, amelioration 1687, 1759

F
in acid mine/rock drainage 1339
in coal 1315
in groundwater 19, 231, 395, 519, 755, 1233, 1495, 1785, 1905
in surface water 655, 755, 1785, 1905
in tailings drainage 1785
Fe
colloids, characterisation of 1391
heterogeneous oxidation of 611
immobilisation of, in treatment of eutrophic lake 1687
in acid lake water 261
in acid mine/rock drainage 435, 1339, 1773
photoreduction in 1075
in aquifer sediment 181
in calcite 1201
in coal 1315, 1949
in coal mine drainage 1085
in constructed wetland 1773
in drain sediment from acid sulfate soils 1837
in groundwater 181, 261, 395, 435, 519, 611, 863, 1137, 1233, 1255, 1391, 1471, 1495, 1655, 1785
in harbour sediment 1801
in laterite 973
in lignite 261
in Mn nodules 1927
in municipal solid waste 1891
in reservoir water 1295
in road sediment 947, 1011
in smelter slag 1039
in surface water 435, 593, 803, 863, 1295, 1567, 1581, 1601, 1785, 1975
in suspended particulate matter 593, 1601
in tailings 1537, 1785
in tailings drainage 1785

in thermal water 105
in tree rings 1367
oxidation of, in groundwater 611, 1391
removal, from drinking water 611, 1391
speciation in tailings drainage 1785
Fe monosulfides, formation 1837
Fe oxide/hydroxide
^{226}Ra in 1085
sorption
of As by 1035
of heavy metals by 1035
of REE by 1035, 1339
of U by 1403, 1937
Finland
Palmottu U/Th deposit 273, 675
Olkiluoto, Eurajoki 1331
Florida, U.S.A. 747, 1189
Foreword 991
France 1699, 1891
Gironde Estuary 769
Loire Valley 957
Lot-Garonne river system 769
Massif Central 1785
Nord–Pas de Calais region 89
Paris Basin 1201
Vosges Mountains 899
Fulvic acid, in cave drip water 1727

Ga
in coal 1315
in fluvial sediment 1453
in marine sediment 1453
in volcanic ash 231
Galena, dissolution kinetics of 835
Ganges River, Bangladesh 1413
Gd
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Ge, in volcanic ash 231
Genova, Italy 787
Geochemical exploration 623

Geochemical mapping 257, 623, 819, 1453
for risk assessment 887
Geochemical monitoring, use of dendrochemistry in 1367
Geochemistry and health 1177
As and human health 163, 169, 181, 201, 231, 245, 435, 1255
NO_3 and human health 335, 709
Se and human health 461
Geopolymers, fly ash based, stability of 435
Georgia, Republic of 1567
Georgia, U.S.A. 1189
Geothermal energy, granite–dry steam interaction 1529
Germany 737, 1687, 1759
Lusatia 261
Oder River 863
Gironde Estuary, France 769
Gölhisar Gölu, Turkey 289
Granite-dry steam interaction 1529
Great Lakes 1137, 1637
Greece 737
Groundwater 1233, 1655
acidic 261
analysis, by capillary electrophoresis 1331
arsenic enrichment in 163, 169, 181, 201, 215, 231, 245, 251, 1137, 1255
sources of 215, 231, 245, 251, 1137, 1255
CO_2-rich 395
coastal plain 1471
high SO_4 in 343
varying redox conditions in 1471
colloids in 119, 1391
contaminated by NO_3 1483
contamination, from agriculture 19, 709
contamination, from mining 19, 245, 251
Cr(VI) in 1123
delineation of catchment area 561
determination of Br and K in 1331
determination of ^3He in 665
evolution of 395, 937, 1355
in limestone 937, 1201
intrusion of sea water into 1517
of deep aquifer 787
of Siberian steppes, evolution of 1905
of volcanic islands 445
oilfield 1495
oxidation of Fe in 611, 1391
paleohydrochemistry of 1711
paleohydrology of 395, 675
poldered 863
residence time of 519
saline 1355, 1495
sources of salinity in 519, 1355
urban, contamination of 709
Gruppodi Voltri springs, Genova, Italy 787
Guangdong Province, China 835

Guinea 469
Guizhou Province, China 435, 1315, 1735

^{2}H
in groundwater 201, 519, 575, 787, 937, 1233, 1655, 1827
in meteoric water 575, 655, 695, 843, 1637
in mud volcano fluid 695
in reservoir water 1295
in surface water 655, 843, 937, 1295, 1637, 1827
^{3}H, in groundwater 519, 787
Hanoi, Vietnam 1255
Harbour sediments, as archives of contaminant history 1801
Hawaii, U.S.A. 947, 1011
He, in groundwater 665, 1655
^{3}He, in groundwater 665, 1655
determination of 665
Herbicides, in groundwater 1471
Hf
in coal 1315
in tephra 289
in volcanic ash 231
Hg
contamination, from Au extraction 379, 1855
in calcine waste 379, 1735
in Fe-oxyhydroxides 379
in fluvial sediment 379, 1453, 1735, 1855
in harbour sediment 1801
in soil 89, 819, 1855
in surface water 593, 1735, 1855
in tailings 379, 1785, 1855
speciation, in mine waste 379
High Plains aquifer, Kansas, U.S.A. 1655
Himalaya 1255
Ho
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Honolulu, Hawaii, U.S.A. 1011
Hopple Bay, St. Lawrence River 1637
HS, in groundwater 787
Hubei Province, China 461
Hungary 1727

I, in groundwater 519, 611
Idaho, U.S.A. 289, 721, 747, 1039
Idrijca Valley, Western Slovenia 55
In, in soil 89
India
    Calcutta 1255
    Sumatra Peninsula 289
    West Bengal 169, 1255
Indonesia, Kalimantan 1949
Ingham County, Michigan, U.S.A. 1413
Ir, in coal 1315
Irtysh River, Siberia, Russia 593
Israel, Tirana Basin 1923
Isotopes
    Am 1561
    B 695, 737, 1625, 1655
    C 55, 395, 519, 675, 695, 937, 1111, 1201, 1233, 1255, 1295, 1655
    C 519
    Cs 1177, 1581
    H 201, 519, 561, 655, 695, 787, 843, 937, 1233, 1295, 1637, 1655, 1827
    He 665, 1655
    I 519
    Li 695
    N 709, 1483, 1655
    O 55, 395, 519, 561, 655, 675, 695, 709, 787, 843, 937, 1201, 1233, 1295, 1315, 1483, 1637, 1655, 1827
    Pb 273, 957, 1098, 1157, 1177, 1567, 1801, 1927
    Pu 1581
    Ra 519, 1085
    S 201, 413, 519, 843, 1655, 1735
    Si 1315
    Sr 359, 695, 899, 1581, 1655
    Th 273
    U 273, 519, 1927
Italy
    Aeolian Islands 665
    Alps 395
    Geneva 787
    Tuscany 787
    Vulcan Island 73

Japan, 843
    Hokuriku 1453

K
    in coal 1315, 1953
    in groundwater 231, 395, 445, 519, 611, 755, 787, 863, 1233, 1255, 1331, 1355, 1471, 1483, 1495, 1517, 1785, 1827, 1905
        determination of 1331
    in laterite 973
    in meteoric water 575, 843
    in Mn nodules 1923
    in mud volcano fluid 695
    in reservoir water 1295

in salt pans 655
in smelter slag 1039
in surface water 469, 575, 655, 755, 843, 1295, 1581, 1735, 1745, 1785, 1827, 1905, 1975
in suspended participate matter 593
in tailings 1537, 1785
in tailings drainage 1785
in thermal water 105
use for determining weathering rates 575
Kalimantan, Indonesia 1953
Kalix River, Sweden 1975
Kangwon-do Province, Korea 843
Kansas, U.S.A. 289, 359, 1655
Khakassia, Siberia, Russia 1905
Kola Peninsula, Russia 1975
Kola River, Russia 1975
Korea
Kangwon-do Province 843
Namyangju 1711
Kriging, use of, in geochemical exploration 623
Kristineberg mine, Sweden 1, 1537

La
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Lac du Bonnet batholith, Manitoba, Canada 519
Lake sediments, as archives of contaminant history 1177
Landfills, environmental impact of 137
Laterite, selective dissolution of Mn oxides in 973
Li
in acid mine/rock drainage 1339
in fluvial sediment 1453
in groundwater 395, 519, 1233, 1517
in marine sediment 1453
in mud volcano fluid 695
in tephra 289
in thermal water 105
^{6}Li, in mud volcano fluid 695
Limestone, cementation of 1201
Lincolnshire, England, U.K 413
Loire Valley, France 957
Long Island, New York, U.S.A. 343

Long Valley Caldera, California 1217
Lot-Garonne river system, France 769
Lu
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Lusatia, Germany 261

Maine, U.S.A. 1098
Mali 469, 1189
Mammoth Mountain, California, U.S.A. 1217
Manitoba, Canada 519
Marrancos, Vila Verde, Portugal 623
Maryland, U.S.A. 1801
Massachusetts, U.S.A. 1098
Massif Central, France 1785
Metallurgical industry, contamination from 593
Mexico
Pátzuaro Lake 1827
Zimapán Valley 245
Mg
in acid mine/rock drainage 1339, 1773
in calcite 1201
in cave drip water 1727
in coal 1315, 1949
in constructed wetland 1773
in ground water 19, 231, 343, 395, 445, 519, 611, 755, 787, 863, 937, 1137,1331 1233, 1255, 1355, 1471, 1483, 1495, 1517, 1655, 1785, 1827, 1905
in laterite 973
in meteoric water 575, 843
in mud volcano fluid 695
in municipal solid waste 1887
in reservoir water 1295
in road sediment 1011
in salt pans 655
in smelter slag 1039
in surface water 469, 575, 655, 755, 843, 937, 1295, 1567, 1581, 1735, 1745, 1785, 1827, 1905, 1975
in tailings 1537, 1785
in tailings drainage 1785
in thermal water 105
uptake, by banana plants 633
Michigan, U.S.A., 1137, 1157, 1413

Mineralisation
Ag 1039
Au 379, 395, 1785
Au/Ag 623, 887
Cu 251, 803, 1039, 1567
Cu/Au/Hg 1855
Cu/Zn 1537
Fe 1971
Hg 379, 593, 1735
Hg/AsTl 435
P 593
Pb/Zn 835
polymetallic 593
U 1601
U/Th 273, 675
Mining, environmental contamination from 379, 435, 593, 769, 803, 887, 1065, 1367, 1403, 1567, 1601, 1735, 1785, 1855, 1975
Mn
immobilisation of, in treatment of eutrophic lake 1687
in acid mine/rock drainage 1339, 1773
in aquifer sediment 181
in calcite 1201
in coal 1315, 1949
in coal mine drainage 1085
in constructed wetland 1773
in drain sediment from acid sulfate soils 1837
in fluvial sediment 137, 803, 957, 1453
in groundwater 201, 395, 519, 611, 863, 1233, 1255, 1391, 1471, 1655, 1785
in harbour sediment 1801
in lake sediment 1177
in laterite 973
in marine sediment 1453
in Mn nodules 1927
in municipal solid waste 1891
in reservoir sediment 1065
in reservoir water 1295
in road sediment 947, 1011
in smelter slag 1039
in soil 89, 623,1367
in surface water 153, 593, 803, 863, 1567, 1581, 1601, 1785, 1975
redox cycling in 1601
in suspended particulate matter 593, 1601
in tailings 1537, 1785
in tailings drainage 1785
in thermal water 105
in tree rings 1367
in wind blown sediment 1189
Mn nodules, origin of, from U and Pb isotope data 1923
Mn oxide, sorption of contaminants by 29
Mo
in coal 1315
in fluvial sediment 1453
in groundwater 231

in laterite 973
in marine sediment 1453
in reservoir sediment 1065
in smelter slag 1039
in soil 89
in surface water 1975
in tailings 1537
in volcanic ash 231
Modelling
adsorption of U by Fe-coated sand 1947
arsenic enrichment in aqueous environments 169
CO_2 sequestration 787, 917
complexation of Am and Pu with humic substances 1581
contaminant metal budgets in river system 769
diffusion of alkaline fluids in nuclear waste repository 1505
environmental behaviour of river basins 469
groundwater evolution 395
groundwater flow 1655
mixing of saline and fresh water 1413
NH_4 activity in groundwater 1495
Pb transport in fluvial syatem 1567
reaction of hyperalkaline fluids in nuclear waste repository 1431, 1699
reactive transport of acid rock drainage 1075
sorption of cations, by Mn oxides 29
tailings groundwater composition 1
uranium adsorption 721, 1643
Mojave Desert, California, U.S.A. 1123
Montana, U.S.A. 289
Mud volcanoes
fluid composition of 695
occurrence 695
Müggel Lake, NE Germany 1759
Multiple correspondence analysis, use of, in geochemical exploration 623
Municipal solid waste
disposal 137
mineralogy of 1891
weathering of 1891
Murmansk, Kola Peninsula, Russia 1975
Murray Basin, Victoria, Australia 1233

N_2, in groundwater 1483, 1655
^{15}N
in groundwater 1483, 1655
to trace sources of NO_3 709
Na
in acid mine/rock drainage 1339
in coal 1315, 1949
in groundwater 19, 231, 343, 359, 395, 445, 519, 611, 755, 787, 863, 1137, 1233, 1255, 1355, 1413, 1471, 1483, 1495, 1517, 1655, 1785, 1827, 1905
in laterite 973
in meteoric water 575, 843
in mud volcano fluid 695
in reservoir water 1295

in road sediment 1011
in salt pans 655
in smelter slag 1039
in surface water 469, 575, 655, 755, 843, 1295, 1567, 1581, 1745, 1785, 1827, 1905, 1975
in suspended particulate matter 593
in tailings 1537
in tailings drainage 1785
in thermal water 105
Namyangju, Korea 1711
Nanjing, China 1553
Nassau, The Bahamas 1189
Nb
in coal 1315
in tephra 289
in volcanic ash 231
Nd
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Ne, in groundwater 665, 1655
Nebraska, U.S.A. 359
Netherlands, The 611, 1391
Nevada County, California, U.S.A. 803
Nevada, U.S.A. 379, 1865, 1879
New Hampshire, U.S.A. 1098
New South Wales, Australia 1837
New York, U.S.A. 343, 1177
Ngorongoro Crater, Tanzania 755
NH_4
in groundwater 181, 863, 1255, 1471, 1495, 1785
removal from 1391
in mud volcano fluid 695
in reservoir water 1295
in soil 819
in surface water 153, 1111
in tailings drainage 1785
Ni
in acid mine/rock drainage 1339
in coal 1315
in drain sediment from acid sulfate soils 1837
in fluvial sediment 137, 803, 1453
in groundwater 519,1785

in harbour sediment 1801
in lake sediment 1177
in laterite 973
in marine sediment 1453
in reservoir sediment 1065
in road sediment 947, 1011
in smelter slag 1039
in soil 89, 623
in surface water 593, 803, 1011, 1785, 1975
in suspended particulate matter 593, 1011
in tailings drainage 1785
in tephra 289
in thermal water 105
in volcanic ash 231
in wind blown sediment 1189
Niger River Basin, Guinea/Mali 469
Nigeria, Benue Trough 1355
NO_2
in surface water 1111
in tailings drainage 1785
NO_3
in drinking water
human health, problems associated with 335, 709
removal by reduction with Fe^0 335
in groundwater 19,181, 335, 395, 519, 709, 863, 1233, 1255, 1471, 1495, 1517, 1785, 1905
denitrification of 1483, 1655
from explosives facility 1483
sources of 709,1655
in meteoric water 575, 843
in soil 1233
in surface water 153, 575, 843, 863, 1111, 1581, 1785, 1905
in tailings drainage 1785
Nord–Pas de Calais region, France 89
North Carolina, U.S.A. 1471
Nottinghamshire England, U.K. 709, 1495
Nuclear waste
disposal 119, 519, 1331, 1431, 1505, 1699, 1711, 1865, 1879
migration from 119, 1431
natural analogue 273, 675
mobility of U in 675
Nueces River Basin, Texas, U.S.A. 1601

^{18}O
for delineation of groundwater catchment 561
geothermometry 675
in carbonates 55, 395, 675, 1201
in groundwater 519, 561, 709, 803, 937, 1233, 1483, 1655, 1827
for tracing sources of NO_3 in 709
in meteoric water 561, 575, 655, 695, 843, 1637
in mud volcano fluid 695
in quartz 1315
in reservoir water 1295
in surface water 655, 843, 937, 1295, 1637, 1827

Oahu, Hawaii, U.S.A. 947, 1011
Oder River, Germany 863
Ohio, U.S.A. 1085, 1111
Oil refining, contamination from 593
Olkiluoto, Eurajoki, Finland 1331
Orco Valley, Alps, Italy 395
Oregon, U.S.A. 1255
Organotin, in environment 324

P
immobilisation of, in treatment of eutrophic lake 1687, 1759
in aquifer sediment 181
in coal 1315, 1949
in groundwater 181, 201, 519, 611, 863, 1255, 1391
in lake sediment, re-mobilisation from 1377
in laterite 973
in meteoric water 575
in smelter slag 1039
in surface water 153, 575, 593, 1111, 1377, 1975
in suspended particulate matter 593
in tailings drainage 1785
Palmottu U/Th deposit, natural analogue site, Finland 273, 675
Paraguay 1745
Paris Basin, France 1201
Partial digestion, procedures for 947
Pátzuaro Lake, Mexico 1827
Pb
in coal 1315
in coal mine drainage 1085
in drain sediment from acid sulfate soils 1837
in fluvial sediment 137, 769, 803, 957, 1098, 1453
as erosion rate indicator 957
in groundwater 519
in harbour sediment 1801
in lake sediment 1157, 1177
sources of 1187
in laterite 973
in marine sediment 1453
in Mn nodules 1927
in municipal solid waste 1887
in peat 593
in reservoir sediment 1065
in road sediment 947, 1011
in smelter slag 1039
in soil 89, 623, 887, 899, 1367, 1553
risk exposure, assessment of 887
in surface water 153, 593, 769, 803, 1011, 1567, 1601, 1975
redox cycling in 1601
in suspended particulate matter 593, 769, 1011, 1601
in tailings 1785
in tailings drainage 1785
in tephra 289
in tree rings 1367

in volcanic ash 231
in wind blown sediment 1189
stability in geopolymers 423
toxicity of 153
uptake by grass 1567
Pb isotopes
in carbonates 273
in coffinite 273
in feldspars 273
in fluvial systems
to study basin evolution 957
to trace source of contaminants 1098, 1567
in Mn nodules 1927
in monazite 273
in pyrite 273
to date U migration in U ore deposit 273
to determine origin of Mn nodules 1927
to trace source of contaminants 1098, 1567
^{210}Pb, to date sediments 1157, 1177, 1801
Pd, in coal 1315
Perth, Western Australia 1377
Pesticides, As contamination from 1098
Phenol, in surface water 153
Phytoremediation 1553
Pilcomayo River, Bolivia 1745
Poland, Vistula river 153
Poldered groundwater, redox processes in 863
Porosity, in limestone, reduction due to cementation 1201
Portugal 137
Azores 445
Sobreira 887
Vila Verde 623
Pr
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Preface 993
Pt, in coal 1315
^{239}Pu
complexation with natural colloids 1581
in soil 1581
in surface water 1581

^{240}Pu
complexation with natural colloids 1581
in soil 1581
in surface water 1581
Punitaqui mining district, Coquimbo region, Chile 1855
Pyrite, framboidal, influence on acid generation 1953

Ra, in groundwater 519
^{226}Ra, sorption by Fe oxide/hydroxide 1085
Rare Earth Elements
As analogues of actinides 1711
in acid mine/rock drainage 1085, 1339
sorption by Fe oxide/hydroxide 1085, 1339
Rb
in coal 1315
in fluvial sediment 1453
in lake sediment 1177
in marine sediment 1453
in tephra 289
in volcanic ash 231
Reply to critical comment 1879
Reservoir sediment, potential leaching from 1065
Reservoir water, anoxia in 1295
Rh, in coal 1315
Rhode Island, U.S.A. 1098
Risk exposure assessment, maps 887
Rn, in groundwater 519
Road sediments, partial digestion of 947
Ru, in coal 1315
Russia
Kola Peninsula 1975
Siberia 593, 1905

S
cycling in a peat bog 413
deposition 413
in aquifer sediment 181
in coal 1315, 1625, 1953
in constructed wetland 1773
in lake sediment 261
in lignite 261
in municipal solid waste 1887
in sphagnum moss 413
in surface water 1975
in tailings 1537, 1785
speciation in tailings drainage 1785
S^{2-}, in groundwater 863
^{34}S
in groundwater 201, 519, 1655
in meteoric water 843
in surface water 413, 843, 1735
use to identify pollution sources 843
Sahara dust, transport across Atlantic Ocean 1189

impact on receiving sites 1189
Salinity, in drylands 1217
Salt balance, of lake 1827
Salt pans, evolution of 655
Sampling, waters, field filtration 995
preservation, for As redox species 995
Santiago del Estero Province, Chaco-Pampean Plain, Argentina 231
São Paulo, Brazil 575
Sb
in coal 1315
in fluvial sediment 1453
in laterite 973
in marine sediment 1453
in smelter slag 1039
in soil 89, 623
in thermal water 105
in volcanic ash 231
Sc
in coal 1315
in fluvial sediment 1453
in marine sediment 1453
in tephra 289
Scioto River, Ohio, U.S.A. 1111
Scotland 1773
Se
human health, problems of 461
in coal 1315
in harbour sediment 1801
in smelter slag 1039
in soil 89, 623
native, occurrence of 461
Selective dissolution, of Mn 973
Serro do Navio, Brazil 973
Sequential extraction
of coal 1315
of sediment 137, 803
of soil 899, 981
Sequestration, of CO_2 787, 917
Shanxi Province, China 19
Sherwood Sandstone aquifer, East Midlands, U.K. 709
Si
in acid mine/rock drainage 1339
in coal 1315, 1949
in groundwater 343, 445, 519, 611, 755, 787, 863, 1233, 1255, 1391, 1471, 1517, 1785, 1905
in laterite 973
in meteoric water 843
in Mn nodules 1923
in reservoir water 1295
in smelter slag 1039
in surface water 469, 755, 843, 1581, 1745, 1785, 1905, 1975
in tailings 1537, 1785
in tailings drainage 1785
in thermal water 105

^{30}Si, in quartz 1315
Siberia, Russia 593, 1901
Siberian steppes, evolution of ground and surface water in 1905
Silverton, Colorado, U.S.A. 1339
Slovenia, Western, Idrijca Valley 55
Sm
    in acid lake water 261
    in acid mine/rock drainage 1339
    in coal 1315
    in coal mine drainage 1085
    in fluvial sediment 1453
    in fractured rock 1711
    in groundwater 261
    in lake sediment 261
    in laterite 973
    in lignite 261
    in marine sediment 1453
    in soil 899
    in tephra 289
    in volcanic ash 231
Smelter slag, leaching of trace elements from 1039
Smelting, environmental contamination from 1975
Sn
    in coal 1315
    in fluvial sediment 1453
    in marine sediment 1453
    in smelter slag 1039
    in soil 89
    in volcanic ash 231
SO_2, emissions 413
SO_4
    in acidic lake water 261
    in acid mine/rock drainage 435, 1339, 1773
    in aquifer sediment 343
    in drain sediment from acid sulfate soils 1837
    in groundwater 19, 181, 201, 231, 261, 343, 395, 435, 445, 519, 611, 709, 755, 787, 863, 937, 1137, 1233, 1255, 1355, 1471, 1483, 1517, 1655, 1785, 1827, 1905
        sources of 343
    in meteoric water 575, 843
    in Mn nodules 1927
    in mud volcano fluid 695
    in reservoir water 1295
    in salt pans 655
    in soil 1233, 1367
    in surface water 413, 435, 469, 575, 655, 755, 787, 843, 863, 937, 1295, 1581, 1745, 1785, 1827, 1905
    in tailings drainage 1785
    in thermal water 105
    in tree rings 1367
    loading 413
Sobreira, Portugal 887
South Africa 747
    Western Cape 655
South Australia 423

South Yorkshire, England, U.K. 1495
Spain
    Betic Cordillera 561
    Canary Islands 819
    Castell de Ferro 1517
Sr
    in acid mine/rock drainage 1339
    in calcite 1201
    in coal 1315
    in fluvial sediment 1453
    in groundwater 359, 395, 519, 1137, 1255, 1355, 1517, 1655
    in lake sediment 1177
    in marine sediment 1453
    in Mn nodules 1927
    in mud volcano fluid 695
    in municipal solid waste 1887
    in peat 593
    in smelter slag 1039
    in soil 899, 1367
    in surface water 593, 1567, 1581, 1745, 1975
    in suspended particulate matter 593
    in tephra 289
    in thermal water 105
    in tree rings 1367
    in volcanic ash 231
^{87}Sr
    in groundwater 359, 1655
    in mud volcano fluid 695
    in soil 899
^{90}Sr
    complexation with natural colloids 1581
    in soil 1581
    in surface water 1581
St. Lawrence River 1637
Stromboli, Aeolian Islands, Italy 665
Sumatra Peninsula, India 289
Summit County, Colorado, U.S.A. 1065
Sweden 1431
    Kalix River 1975
    Kristineberg mine 1, 1537
Switzerland 119, 1431
Syria 747

Ta
    in coal 1315
    in tephra 289
    in volcanic ash 231
Tailings, remediation of 1537
Taiwan 169, 695
Tanzania, Ngorongoro Crater 755
Tb
    in acid lake water 261
    in acid mine/rock drainage 1339

in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Te, in soil 623
Tenerife, Canary Islands, Spain 819
Tennessee, U.S.A. 1039
Tephra, chemistry of glass hazarads in 289
Tephrochronology, use of ICP-MS for 289
Texas, U.S.A 1601
Th
in carbonates 273
in coal 1315
in feldspars 273
in fluvial sediment 957, 1453
in marine sediment 1453
in Mn nodules 1923
in soil 899
in tephra 289
in volcanic ash 231
Thermal water, chemistry and origin of 105
Thorne Moors, Lincolnshire/Yorkshire, England, U.K. 413
Ti
in coal 1315, 1953
in laterite 973
in smelter slag 1039
in suspended particulate matter 593
in tailings 1785
in tephra 289
Timna basin, Israel 1927
Tl
in fluvial sediment 803, 1453
in marine sediment 1453
in soil 89
in surface water 803
Tm
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261
in lake sediment 261
in laterite 973

in lignite 261
in marine sediment 1453
in tephra 289
in volcanic ash 231
Toxicity, of metals, assessment of 153
Tributylin, sorption of 324
Tunisia 747
Turkey
Emet Geothermal Field 105
Gölhisar Gölu 289
Tuscany, Italy 787
Tweed River, New South Wales, Australia 1837

U
adsorption, modelling of 721, 1643, 1937
in carbonates 273
in coal 1315
in feldspars 273
in fluvial sediment 1453
in groundwater 231, 519, 1601
in marine sediment 1453
in Mn nodules 1923
in phosphogypsum 747
in reservoir water 1295
in road sediment 1011
in soil 899
in surface water 1295, 1601
redox cycling in 1601
in suspended particulate matter 1011, 1601
in tephra 289
in volcanic ash 231
mobility at natural analogue site 675
sorption of 1403, 1643
transport,
controls on 1403
in the subsurface 721
^{234}U
in carbonates 273
in Mn modules 1923
$^{234}U/^{238}U$, to distinguish between types of Mn nodules 1927
^{235}U, in carbonates 273
$^{238}U/^{230}Th$, to date U migration in U ore deposit 273
Ukraine, Chernobyl 1581
United Kingdom
England 1431
Cheshire 1495
Derbyshire 1495
East Midlands 709
Lincolnshire 413
Nottinghamshire 709, 1495
Yorkshire 413, 1495
Scotland 1773
Urban pollution 575, 593, 709, 1011, 1177, 1567

U.S.A. 169, 257
Alabama 1189
Alaska 289
Arizona 251
Arkansas 1255
California 289, 379, 803, 1123, 1217, 1483
Chesapeake Bay 1801
Colorado 1065, 1075, 1339, 1367, 1643
Connecticut 1098
Florida 747, 1189
Georgia 1189
Hawaii 947, 1011
Idaho 289, 721, 747, 1039
Kansas 289, 359, 1655
Maine 1098
Maryland 1801
Massachusetts 1098
Michigan 1137, 1157, 1413
Montana 289
Nebraska 359
Nevada 379, 1865, 1879
New Hampshire 1098
New York 1177
Long Island 343
North Carolina 1471
Ohio 1085, 1111
Oregon 1255
Rhode Island 1098
Tennessee 1039
Texas 1601
Vermont 1039, 1098
Virginia 1471, 1937

V
in coal 1315
in fluvial sediment 137, 957, 1453
as erosion rate indicator 957
in groundwater 231, 519, 1601
in laterite 973
in marine sediment 1453
in peat 593
in road sediment 1011
in soil 89
in surface water 593, 1011, 1601
in suspended particulate matter 101, 593, 1601
in tephra 289
in volcanic ash 231
Vanadzor, Armenia 1567
Venezuela 1295
Verde Valley, Arizona, U.S.A. 251
Vermont, U.S.A. 1039, 1098
Vetiver grass (*Vetiveria zizanioides*) use in phytoremediation 1553
Victoria, Australia 1233

Vietnam, Hanoi 1255
Vila Verde, Portugal 623
Virgin Islands, U.S. 1189
Virginia, U.S.A. 1471, 1937
Vistula river, Poland 153
Volcanic activity, recent, identification of centres by geochemistry 819
Vosges Mountains, France 899
Vulcano Island, Italy 73

W
in smelter slag 1039
in volcanic ash 231
Waste disposal
landfill 137
municipal solids 137
nuclear 119, 519, 1331, 1431, 1505, 1699, 1711, 1865, 1879
use of geopolymers for 423
Water balance, of lake 1827
Water–rock interaction 519, 787, 1201, 1355, 1431, 1711
Watershed, Niger Basin
geochemistry of 469
hydrograph separation in 469
modelling environmental behaviour in 469
rate of erosion of 469
Weathering
effect of acid leaching on soil 899
of municipal solid waste 1891
of smelter slag 1039
rate
in soil 1217
in river basins 469, 575
use of K for determination of 575
use of Pb and V as indices of 957
West Bengal, India 169, 1255
Western Australia 1377
Western Cape, South Africa 655

Y
in acid mine/rock drainage 1339
in coal 1315
in fluvial sediment 137, 1453
in marine sediment 1453
in smelter slag 1039
in tephra 289
in volcanic ash 231
Yb
in acid lake water 261
in acid mine/rock drainage 1339
in coal 1315
in coal mine drainage 1085
in fluvial sediment 1453
in fractured rock 1711
in groundwater 261

in lake sediment 261
in laterite 973
in lignite 261
in marine sediment 1453
in soil 899
in tephra 289
in volcanic ash 231
Yorkshire, England, U.K. 413, 1495
Yucca Mountain, Nevada, U.S.A. 1865, 1879
Yukon, Canada 289
Yunnan Province, China 435

Zimapán Valley, Mexico 245
Zn
in acid mine/rock drainage 1339
in coal 1315
in drain sediment from acid sulfate soils 1837
in fluvial sediment 137, 769, 803, 1098, 1453, 1857
in groundwater 231, 519, 1785
in harbour sediment 1801
in lake sediment 1177
in laterite 973
in marine sediment 1453
in Mn nodules 1927
in municipal solid waste 1887
in peat 593
in phosphogypsum 747
in reservoir sediment 1065
in road sediment 947, 1011
in smelter slag 1039
in soil 89, 623, 1367, 1553, 1855
in surface water 153, 593, 769, 803, 1011, 1567, 1785, 1855, 1975
in suspended particulate matter 593, 769, 1011
in tailings 1537, 1785, 1855
in tailings drainage 1785
in tephra 289
in thermal water 105
in tree rings 1367
in volcanic ash 231
in wind blown sediment 1189
uptake by grass 1553
toxicity of 153
Zr
in coal 1315
in suspended particulate matter 593
in tephra 289
in volcanic ash 231

AUTHOR INDEX

(Corrigendum-C; Comment-Cc; Editorial-Ed; Forward-F, Preface-P; Reply-R)

Ahmed K. M. 163 (Ed), 181, 201
Akai J. 215
Akai K. 215
Akhter S. H. 181
Alam S. M. M. 181
Al-Bich F. 747
Albouy R. 231
Al-Masri M. S. 747
Almeida C. 137
Álvarez C. E. 819
Amano H. 1581
Amaral C. S. 445
Amin Y. 747
Anawar H. Md. 215
Andreo B. 561
Apps J. A. 917
Armienta A. 245
Arn K. 1295
Arnold T. 1403
Atekwana E. A. 937
Aubert D. 899
Audry S. 769
Ayt Ougougdal M. 1201
Ayuso R. A. 1097
Azaroual M. 1785

Baize D. 89
Balistrieri L. S. 29
Ball J. W. 1123
Banerjee D. M. 1255
Banks D. 1905
Baranger P. 1785
Bar-Matthews M. 1927
Barth J. A. C. 1637
Bellanger B. 1295
Beller H. R. 1483
Beltran V. L. 1011
Berg U. 1759
Bernhard G. 1403
Bhattacharya P. 163 (Ed), 169, 181, 231
Bhuyian M. A. H. 181
Bischoff J. L. 1827
Blanc G. 769
Blanc P. 1505
Blomqvist R. 273, 675
Blyth A. 675
Bodénan F., 1785, 1891
Boeglin J.-L. 469, 817 (C)
Böhlke J. K. 1655
Bonorino G. 231
Bonotto D. M. 575
Bosbach D. 1403
Bossy C. 769
Bottrell S. 413
Bouchet A. 1699
Bourrié G. 973
Bozau E. 261
Bradbury M. H. 119
Braibant G. 1785
Brandenberger J. 1601
Brandt F. 1403
Brown C. J. 343
Brown G. E. Jr. 379
Bundschuh J. 231
Buschaert S. 1201
Bussen J. O. 947
Bustillo V. 469, 817 (C)

Caballero F. 561
Carapezza M. L. 73
Cardoso Fonseca E. 623
Carey A. E. 993, 1111
Carlsen T. 1483
Carrasco F. 561
Cartwright I. 1233
Cassagnabère A. 1699
Cathelineau M. 1201
Centeno L. M. 1085
Chabaux F. 1295
Chadha D. K. 1255
Chae B.-G. 1711
Chatelet-Snidaro L. 1891
Chatterjee A. 1255
Chen H.-W. 695
Chen Y. 1553
Cheng X. 1233
Choe S. 335
Christenson S. C. 1655
Cipolli F. 787
Clauer N. 1295
Coates J. T. 721
Çolak M. 105
Compton J. S. 645
Compton-O'Brien A.-M. 251
Cornwell J. 1801
Cortes J. 231
Coulson J. 413
Cronin A. 1255
Cruz J. V. 445
Curtis G. P. 1643

da Conceição F. T. 575
Da Silva E. F. 623, 887
Dai S. 1315
Darnley A. G. 257
Davis J. A. 1643
De Carlo E. H. 1011
de Cisneros C. J. 561
Deloule E. 1201
Delvaux B. 633
Dematteis A. 395
Dennis P. F. 709
Deocampo D. M. 755
Dexian L. 435
Deyhle A. 737
Dhar R. 201
Dominik J. 153
Donnert D. 1759
Douay F. 89
Dublyansky Y. V. 1865 (Cc)
Dufey J. E. 633
Dunlap C. 1567
Duren S. M. 1075

Ehrlich S. 1927
Eimers J. L. 1471
Elzerman A. W. 721
Eriksen T. M. 1177

Farias B. 231
Faure G. 991 (F), 1065, 1085
Ferreira da Silva E. 623, 887
Ferrell R. 819
Fett J. 1157
Figueiras J. 137
Fjeld R. A. 721
Flegal A. R. 803, 1567
Fonsec E. G. 623
Forbes L. 413
Forsberg J. 1537
Fourcade S. 1201
Fourrier H. 89
Foust R. D. Jr. 251
Fox P. 1643
Frape S. 675
Frengstad B. 1905
Friske P. 257
Frost C. 359
Fukada T. 709
Fukuhara H. 215
Fulton S. 1233

Gambardella B. 787
Garcin M. 957
Garduño-Monroy V. H. 1827
Garrett R. 257
Gascoyne M. 519
Gasparics T. 1727
Gaucher E. C. 1505, 1785
Gavrielli I. 201
Gemici U. 105
Gieskes J. M. 695
Gilbin R. 153
Giot D. 957
Gonçalves M. A. 137
Gordeev V. V. 593
Gosselin D. C. 359
Graney J. R. 1177
Granieri D. 73
Grossman C. 721
Grossman J. N. 257
Grosz A. E. 257
Guéguen C. 153
Guo H. 19
Gustafsson J.-P. 169

Halicz L. 1927
Hamelin B. 273
Hammarstrom J. M. 1039
Harlavan Y. 1927
Harvey F. E. 359
Hasan M. A. 181
Herbert B. 1601
Helvaci C. 105
Hering J. G. 1217
Hernández P. A. 819
Hervig R. L. 1625
Higueras P. 1855
Hiscock K. M. 709
Hoch A. R. 1431
Hoch M. 323
Holden W. 1905
Holmes C. W. 1189
Holmström H. 1537
Houghton S. 1255
Howarth R. J. 1255
Hu G. 835
Hudson G. B. 1483
Hudson-Edwards K. A. 1255, 1745
Hull L. C. 721
Huon S. 1295
Hutcheon I. E. 1495

Ibrahim S. 747
Ikehara K. 1453
Imai N. 1453
Imam M. B. 181

Ingri J. 1975
Inguaggiato S. 665
Israde-Alcántara I. 1827
Izbicki J. A. 1123
Izumi K. 215

Jacks G. 163 (Ed), 169
Jacquot E. 1699
Ji G. 981
Jiang X. 981
Jiménez de Cisneros C. 561

Karnachuk O. V. 1905
Khan A. A. 181
Khim J. 335
Kim C. S. 379
Kim E.-H. 1801
Kim K.-H. 1711
Kim Y. 1711
Kimball B. A. 1339
Kloppmann W. 957
Koh D.-C. 1711
Kohler M. 1643
Kopf A. 737
Korablov S. F. 1529
Korablova I. R. 1529
Krawczyk-Bärsch E. 1403
Krishnamurthy R. V. 937
Kurkjian R. 1567

Lancelot J. 273
Lassin A. 1785
Lavaux G. 769
Leblanc M. 261
Lee G. 1085
Lee S.-G. 1711
Lee T. 695
Li D. 1315
Li J. 835
Li S. 461
Li X. 1553
Liang X. 461
Liljestrand H. M. 335
Lillo J. 1855
Liñán C. 561
Linge K. L. 1377
Linklater C. M. 1431
Liu C.-Q. 1735
Logue B. A. 1937
Long D. T. 993 (P), 1157
Louchouarn P. 1601
Lowry D. 1255
Lyons W. B. 993 (P)

Macfarlane P. A. 359
Madariaga J. M. 855
Madrid V. 1483
Maest A. S. 995
Malmström M. E. 1
Manning D. A. C. 1495
Mäntynen M. 1331
Marfia A. M. 937
Marini L. 787
Mariotti A. 1295
Marshall B. D. 1879 (R)
Martin R. 231
Martineau F. 1201
Mason R. P. 1801
Massman G. 863
Masuda H. 215
Matray J.-M. 1505
Matsunaga T. 1581
Maturana H. 1855
McArthur J. M. 1255, 1413
McCall P. 1137
McClesky R. B. 995
McKnight D. M. 1075
McMahon P. B. 1655
McNab W. W. 1483
Melville M. D. 1837
Merz C. 863
Meunier A. 1699
Michau N. 1505
Mihucz V. G. 1727
Miller R. 1189
Mishra R. 1255
Mohapatra P. 251
Mokrotovarova O. 1975
Morata D. 1855
Mouélé F. 973
Mudry J. 561
Munk L. A. 1065
Munson S. A. 1111
Murray J. W. 29

Nagao S. 1581
Naidu R. 163 (Ed)
Nakajima T. 1453
Nakano S. 215
Neaman A. 973
Négrel 957
Neumann T. 1687, 1759
Neymark L. A. 1879 (R)
Ngwenya B. T. 1773
Nichol C. 1233
Nogueira J. M. F. 137
Nordstrom D. K. 995, 1339

Nootens D. 633
Novak M. 413
Noy D. J. 1431
Nüesch R. 1759

Ohfuji H. 215
Öhlander B. 1537, 1975
Ohta A. 1453
Olazabal M. A. 855
Oldham C. E. 1377
Ottonello G. 787
Oyarzún J. 1855
Oyarzun R. 1855

Paces J. B. 1879 (R)
Palyanova G. P. 1865 (Cc)
Panton W. F. 937
Pardos M. 153
Park Y. 843
Parnachev V. P. 1905
Patinha C. 623, 887
Patino L. 1157
Pearce N. J. G. 289
Pekdeger A. 863
Pekka L. 1975
Pérez N. M. 819
Perkins W. T. 289
Peterman Z. E. 1879 (R)
Phair J. W. 423
Piantone P. 1785, 1891
Piatak N. M. 1039
Pinto L. S. 887
Pomiés C. 273
Preece S. J. 289
Probst A. 899
Proix N. 89
Pruess K. 917
Pulido-Leboeuf P. 1517
Purohit R. 1255
Putnis C. V. 137

Rachold V. 593
Ramírez S. 1699
Ramos J. A. 245
Ranville M. 803
Raposo J. C. 855
Ravenscroft P. 1255, 1413
Reid M. 1233
Reifel J. 251
Reis A. P. 623, 887
Ren D. 1315
Reuther H. 1403
Riabtseva M. 1975
Ridley W. I. 1367
Rizzo A. 665
Robinson Jr. G. R. 1097
Rodríguez R. 245
Rodwell W. R. 1431
Roelofs J. G. M. 1745
Rossetti P. 395
Rough D. 803
Rovio S. 1331
Roworth P. 413
Rufyikiri G. 633
Ruskeeniemi T. 675
Rytuba J. J. 379

Sacchi E. 395
Salazar J. M. L. 819
Salmon S. U. 1
Schäfer J. 769
Schlosser P. 201
Schoonen M. A. A. 343
Schvartz C. 89
Schwab V. 55
Schwesig D. 323
Seal II R. R. 1039
Seidel J. L. 261
Shanks III W. C. 1827
Shao L. 1315
Shcherbakova E. 1537
Shen Z. 1553
Simpson H. J. 201
Sirén H. 1331
Skinner W. M. 687, 1953
Smart R. St. C. 687, 1953
Smirnov S. Z. 1865 (Cc)
Smith D. B. 257
Smith J. 1837
Smith J. D. 423
Smith M. 645
Smith R. W. 1937
Smolders A. J. P. 1745
Song H. 1315
Sousa A. J. 623
Spangenberg J. E. 55
Spence M. 413
Spruill T. B. 1471
Sracek O. 169, 181
Stärk H.-J. 261
Steinmann P. 1295
Sterckeman T. 89
Stephens J. C. 1217
Stewart W. A. 1953
Stille P. 899
Storniolo A. 231

Stotler R. 359
Stüben D. 1687, 1759
Stute M. 201
Sutherland R. A. 947
Szramek K. 1137

Tachibana Y. 1453
Tack F. M. G. 947
Takeda S. 1581
Talnagi J. 1085
Talukder T. 1255
Tang Y. 1315
Tarcan G. 105
Tardy Y. 469, 817 (C)
Tatár E. 1727
Taylor H. E. 1339
Temminghoff E. J. M. 611, 1391
Terashima S. 1453
Tesoriero A. J. 1471
Thomas J. E. 687, 1953
Tijani M. N. 1355
Tissot P. 1601
Tits J. 119
Tkachenko Yu. 1581
Tomlinson M. S. 1011
Tonkin J. W. 29
Trolard F. 973
Trouiller A. 1201

Ueno T. 1581

Vallés V. 1295
Van der Velde G. 1745
van Deventer J. S. J. 423
van Geen A. 201
van Riemsdijk W. H. 611, 1391
Vedernikov A. A. 1905
Velasquez F. 1295
Verplanck P. L. 1339
Vieillard P. 1699
Viezer J. 1637
Vlasova I. E. 593
von Brömssen M. 169
Vowinkel E. 257

Walpersdorf E. 1687
Walter L. M. 1137
Wang Yanxin 19
Wang Yurong 835
Wanty R. B. 1367
Weaver T. R. 1233
Weber P. A. 687, 1953
Weisener C. G. 1953
Welch A. H. 163 (Ed)
Weng R. L. 611
Westall J. C. 1937
Westgate J. A. 289
Whelan J. F. 1879 (R)
Widerlund A. 1537, 1975
Wieland E. 119
Williams L. B. 1625
Williams-Jones A. E. 435
Witte K. M. 1367
Wolthoorn A. 611, 1391
Woulds C. 1773
Wu P. 1735

Xu T. 917

Yamasaki N. 1529
Yang Y. 1735
Yohn S. 1157
Yongxuan Z. 435
Yoshimura T. 215
You C.-F. 695
Yu J.-Y. 843
Yui T.-F. 695
Yunmei Y. 435

Zámbó L. 1727
Záray G. 1727
Zhang C. 887
Zhang G. 1735
Zhang S. 835
Zheng B. 461
Zheng Y. 201
Zhenmin G. 435
Zhu J. 461
Zhu M. 981
Ziegler A. D. 947
Zuccolini M. V. 787
Zuloaga O. 855
Zuo W. 461